

ABSTRACT OF THE DISCLOSURE

A high accuracy search and tracking system that uses a round-trip messaging scheme in which the time of arrive (TOA) of ranging signals is accurately determined to yield the range estimates between a target communications device and one or more search communications devices. Successive ranging estimates are used by a search device to home in upon the target device. The physical location pinpoint communications system can be used alone, or in combination with other location estimation systems that can be used initially, or throughout the search and tracking process to pinpoint the physical location of the target device. The search radio(s) transmits ranging signals to the target radio which responds by transmitting reply ranging signals. Upon reception of the reply ranging signal, the search radio determines the range to the reference radio from the signal propagation time. Errors in TOA estimates can be minimized using advanced processing techniques, if required.